

# **STPS1H100**

## HIGH VOLTAGE POWER SCHOTTKY RECTIFIER

**Table 1: Main Product Characteristics** 

I <sub>F(AV)</sub>	1 A
V <sub>RRM</sub>	100 V
T <sub>j</sub> (max)	175°C
V <sub>F</sub> (max)	0.62 V

## **FEATURES AND BENEFITS**

- Negligible switching losses
- High junction temperature capability
- Low leakage cuurent
- Good trade-off between leakage current and forward voltage drop
- Avalanche capability specified

# SMA SMB (JEDEC DO-214AC) STPS1H100U STPS1H100A STPS1H100U

## **DESCRIPTION**

Schottky rectifiers designed for high frequency miniature Switched Mode Power Supplies such as adaptators and on board DC/DC converters. Packaged in SMA or SMB.

**Table 2: Order Codes** 

Part Number	Marking
STPS1H100A	S11
STPS1H100U	G11

Table 3: Absolute Ratings (limiting values)

Symbol	Paramete	Value	Unit	
V <sub>RRM</sub>	Repetitive peak reverse voltage		100	V
I <sub>F(RMS)</sub>	RMS forward voltage		10	Α
I <sub>F(AV)</sub>	Average forward current	$T_L = 160^{\circ}C$ $\delta = 0.5$	1	Α
I <sub>FSM</sub>	Surge non repetitive forward current tp = 10ms sinusoidal		50	Α
I <sub>RRM</sub>	Repetitive peak reverse current	epetitive peak reverse current tp = 2µs F = 1kHz square		Α
I <sub>RSM</sub>	Non repetitive peak reverse current	n repetitive peak reverse current tp = 100µs square		Α
P <sub>ARM</sub>	Repetitive peak avalanche power $tp = 1\mu s$ $Tj = 25$ °C		1500	W
T <sub>stg</sub>	Storage temperature range	-65 to + 175	°C	
T <sub>j</sub>	Maximum operating junction temperatu	175	°C	
dV/dt	Critical rate of rise of reverse voltage	10000	V/µs	

<sup>\*:</sup>  $\frac{dPtot}{dTj} > \frac{1}{Rth(j-a)}$  thermal runaway condition for a diode on its own heatsink

**Table 4: Thermal Resistance** 

Symbol	Parameter	Value	Unit	
B., 4.5	Junction to lead	SMA	30	°C/W
R <sub>th(j-l)</sub> Junction to lead	Surremon to lead	SMB	25	C/VV

**Table 5: Static Electrical Characteristics** 

Symbol	Parameter	Tests conditions		Min.	Тур	Max.	Unit
I_ *	I <sub>R</sub> * Reverse leakage current	T <sub>j</sub> = 25°C	$V_R = V_{RRM}$			4	μΑ
'H		T <sub>j</sub> = 125°C			0.2	0.5	mA
V <sub>F</sub> ** Forward voltage drop	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A			0.77		
	T <sub>j</sub> = 125°C			0.58	0.62	V	
	$T_j = 25^{\circ}C$	I <sub>E</sub> = 2A			0.86	V	
		$T_j = 125^{\circ}C$	- LA		0.65	0.7	

Pulse test:

To evaluate the conduction losses use the following equation:  $P = 0.54 \times I_{F(AV)} + 0.08 I_{F}^{2}(RMS)$ 

Figure 1: Average forward power dissipation versus average forward current

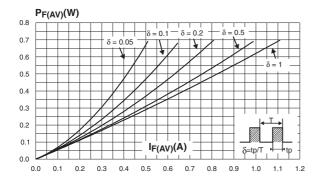


Figure 2: Average forward current versus ambient temperature ( $\delta$  = 0.5)

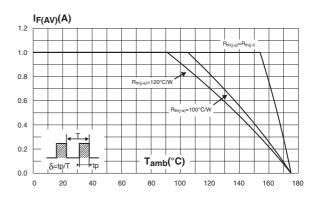


Figure 3: Normalized avalanche power derating versus pulse duration

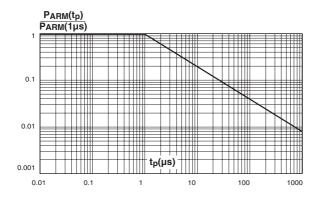
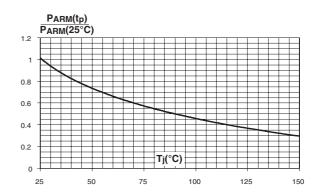


Figure 4: Normalized avalanche power derating versus junction temperature



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<sup>\*</sup> tp = 5 ms,  $\delta$  < 2%

<sup>\*\*</sup> tp = 380 µs,  $\delta$  < 2%

Figure 5: Non repetitive surge peak forward current versus overload duration (maximum values) (SMA)

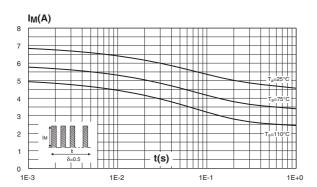


Figure 7: Relative variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board, e(Cu)=35µm, recommended pad layout) (SMA)

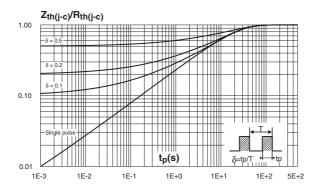


Figure 9: Reverse leakage current versus reverse voltage applied (typical values)

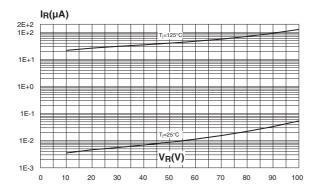


Figure 6: Non repetitive surge peak forward current versus overload duration (maximum values) (SMB)

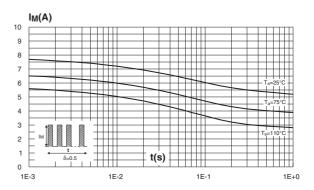


Figure 8: Relative variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board, e(Cu)=35µm, recommended pad layout) (SMB)

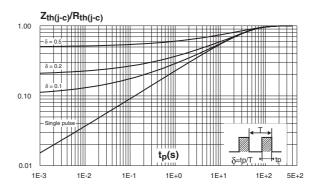
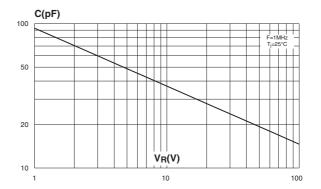


Figure 10: Junction capacitance versus reverse voltage applied (typical values)



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Figure 11: Forward voltage drop versus forward current (maximum values)

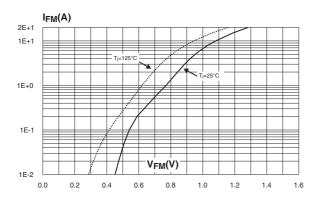


Figure 13: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35µm) (SMB)

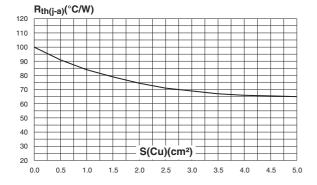
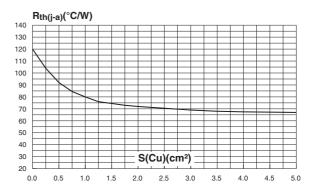
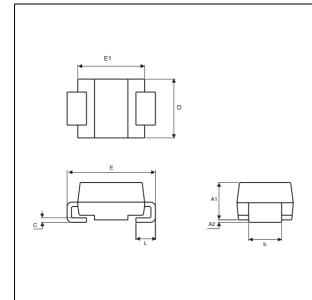


Figure 12: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35µm) (SMA)



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Figure 14: SMA Package Mechanical Data



	DIMENSIONS				
REF.	Millin	neters	Inc	hes	
	Min.	Max.	Min.	Max.	
A1	1.90	2.03	0.075	0.080	
A2	0.05	0.20	0.002	0.008	
b	1.25	1.65	0.049	0.065	
С	0.15	0.41	0.006	0.016	
Е	4.80	5.60	0.189	0.220	
E1	3.95	4.60	0.156	0.181	
D	2.25	2.95	0.089	0.116	
L	0.75	1.60	0.030	0.063	

Figure 15: SMA Foot Print Dimensions (in millimeters)

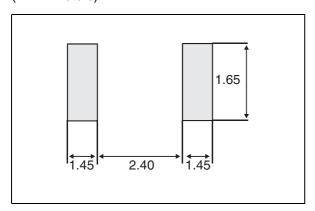
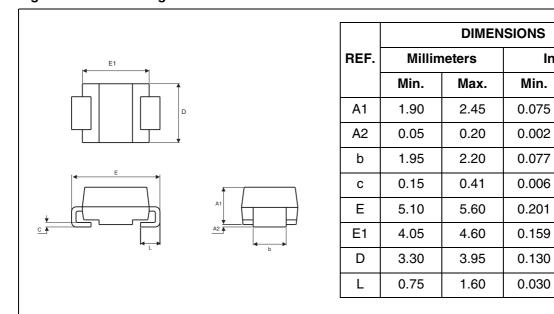


Figure 16: SMB Package Mechanical Data



Inches

Max.

0.096

800.0

0.087

0.016

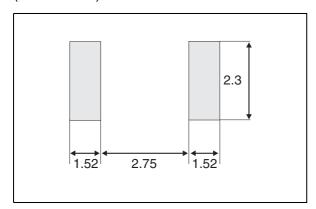
0.220

0.181

0.156

0.063

**Figure 17: SMB Foot Print Dimensions** (in millimeters)



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## **Table 6: Ordering Information**

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS1H100A	S11	SMA	0.068 g	5000	Tape & reel
STPS1H100U	G11	SMB	0.107 g	2500	Tape & reel

- Band indicates cathode
- Epoxy meets UL94, V0

**Table 7: Revision History** 

Date	Revision	Description of Changes
Jul-2003	4A	Last update.
Aug-2004	5	SMA package dimensions update. Reference A1 max. changed from 2.70mm (0.106inc.) to 2.03mm (0.080).

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